

AGRICULTURAL EMPLOYMENT IN SELECTED AREAS OF ARIZONA

Research Report 277



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FOREWORD

This research report is the third in a series dating back to 1973 which has attempted to provide valid up-to-date information on the level of employment in Arizona of those occupations requiring agricultural competencies. Because of the wide spectrum of jobs in a widely diverse industry, such data have been very difficult to complete by traditional reporting systems. The different jobs included in this report tend to define the scope of occupations requiring training in agriculture. This in and of itself should have value as a vocational guidance reference.

The number of persons employed full-time and part-time provides a relative measure of the need for educational programs in agriculture. The numbers reported are estimates based upon actual data from randomly selected businesses. Such estimates tend to be conservative in that some parts of the State have not been

surveyed and thus employment associated with the agricultural trends in such areas are not included. Specifically the ranching and forestry industries associated with the northern parts of the State are not included in this report.

In contrast to previous reports in this series, this report is written in a "popularized," non-technical, version. It is hoped that by reporting employment information in this form it will increase the readability and utilization of the data reported.

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Agricultural Employment in Selected Areas of Arizona

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American agriculture is "big business" carried on by many small diversified types of operations. This relatively small scope of the many businesses which collectively form the agricultural industry often results in a misconception of the total industry. Persons not closely associated with agriculture often perceive it narrowly as farming and ranching. Further, they perceive the farms and ranches as small family operations which are not particularly profitable and which have extremely limited employment opportunities. By contrast, the few large corporations which comprise the steel industry are perceived as large profitable operations offering many highly desirable employment opportunities. Commonly, people perceive these so-called "industrial giants" as essential to the welfare of the country while overlooking the absolute essential nature of agriculture.

The fallacy of such conceptions can be illustrated in several ways. Agriculture is the Nation's largest employer. Approximately one out of four jobs in private employment is related to some phase of agriculture. Broadly defined agriculture includes those businesses directly involved in and/or supporting the processing and marketing of food and fiber along with the management of our renewable natural resources. Agriculture production alone provides more employment than the combined payrolls of transportation, steel and automobile industries in this country.¹

The capital investment in agriculture is another matter about which misconceptions exist. The average capital investment in agriculture exceeds \$98,000 per worker. On commercial family farms, the investment per worker often exceeds \$150,000. This compares with an average of \$55,000 per worker in manufacturing.² The investment in agriculture coupled with advanced technology has resulted in increases in productivity which have become the marvel of the world.

Continued expansion of the productivity of American agriculture depends upon several factors. One of those factors is an adequately trained work force. To this end, educators, educational planners and guidance coun-

selors must realize the importance of providing education in agriculture and making known the employment opportunities which it offers.

The types of occupations in agriculture vary from those classified as unskilled to those on the professional level. The scope or number of job opportunities at each level of employment tends to be dynamic and continually adjusting to changes in mechanization and specialization. Some jobs have decreased significantly in the number of persons employed while others have expanded. The decreases have, for the most part, been in the unskilled types of jobs which have tended to be replaced by some form of mechanization. This substitution replaces an unskilled worker with a person who requires specialized training in the operation and maintenance of machinery and equipment. The result is an increase in the overall number of employees needed with agricultural skills and knowledge. The logical outgrowth of such changes in employment is the need to expand the opportunities for students to receive an agricultural education.

The importance of accurate data on occupational opportunities in vocational programs such as vocational agriculture is substantiated by the 1976 Amendments to the Vocational Education Act of 1963. The Act specifically specifies that the State Plan submitted by each state must: "Assess the present and future needs for job skills within the state ... through consideration of the latest available data of present and projected employment"³

¹Remarks by Richard E. Bell, Assistant Secretary of Agriculture for International Affairs and Commodity Programs, before a National Seminar on Agriculture and Agri-business, Kansas City, Missouri, March 24, 1976, p. 5.

²Ibid., p. 4.

³Sec. 107 (b) (1): 20 U.S.C. 2307.

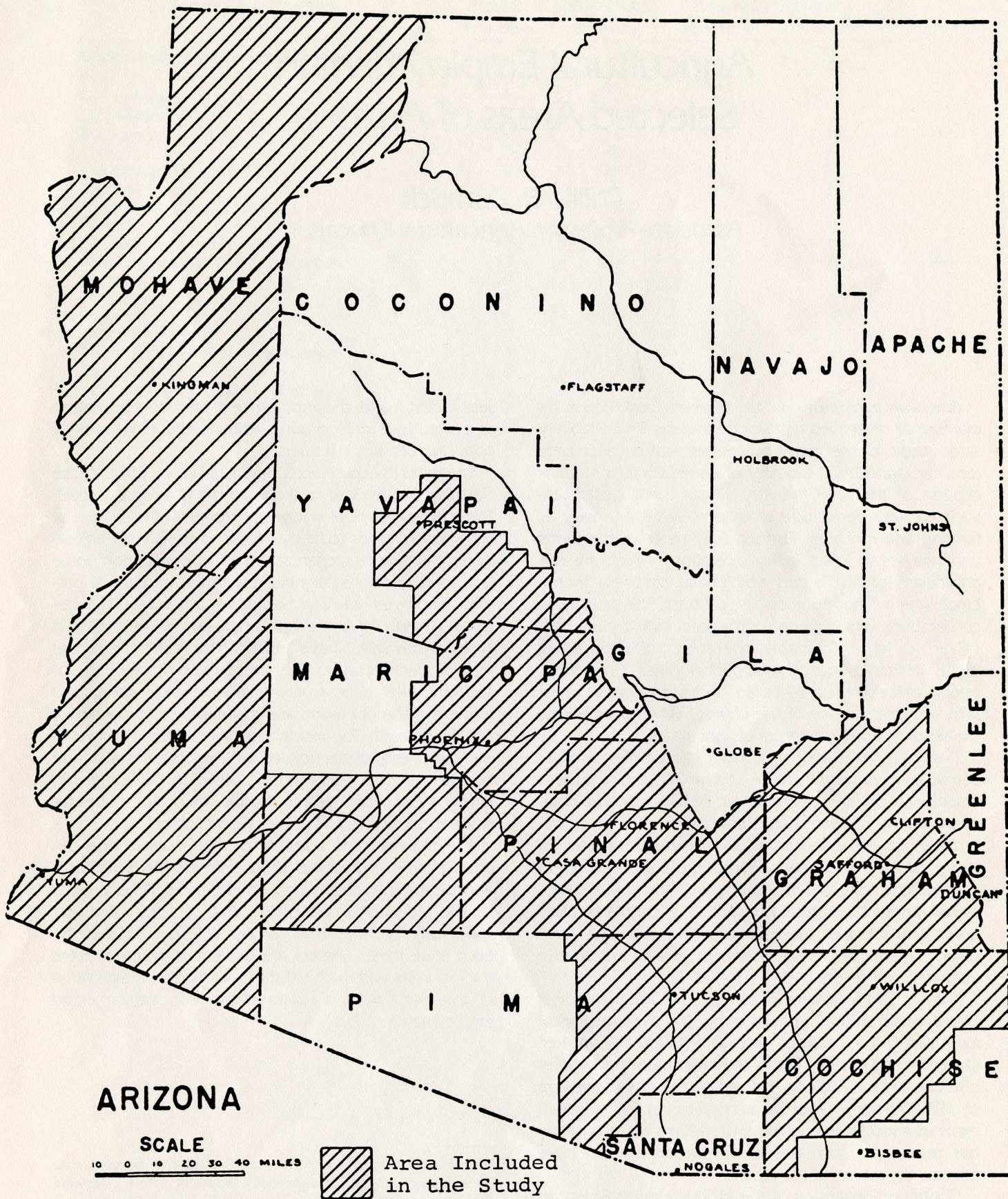


Figure 1. Location of area included in the study.

Agricultural Employment in Arizona

During the past 10 years the Department of Agricultural Education at the University of Arizona has collected, expanded and updated data on agricultural employment within the State. The data gathered have been limited to those jobs which employers indicated required some knowledge or skill in agriculture. Thus, the data were limited primarily to semi-skilled and more complex level jobs. Further, the data were derived from actual contact with and information provided by employers.

The latest update conducted in 1977, along with the one conducted in 1973-74, was based upon a random sampling technique involving contact with businesses previously surveyed plus new businesses within the surveyed areas shown in Figure 1. The number of both full-time and part-time employees in each job title was recorded for each business. Job titles were then combined into appropriate instructional program areas in order to reflect the magnitude of such programs in Arizona. The five instructional program areas include: Agricultural Production, Agricultural Supplies/Service, Agricultural Mechanics, Ornamental Horticulture and Agricultural Resources.

The number of businesses actually contacted and from which information was obtained in 1977 included 218 randomly selected and 301 new businesses. The breakdown of the businesses by types is shown in table 1. Based upon the employment information provided by the randomly selected businesses and by comparing present employment with past employment levels, it was possible to project the current level of agricultural employment for the areas of Arizona shown in figure 1.

It is estimated that during 1977 there were 33,555 people employed in those parts of the state included in the survey who required some knowledge or skill in agriculture. This compares with an estimate of 23,455 employees made in 1974. The changes in the estimated number of employees between 1974 and 1977 can be seen in figure 2. It should be remembered that the increase is due to an expanded area surveyed and to the

increased level of employment in the randomly sampled businesses.

The breakdown of jobs into the five instructional program areas is shown in table 2. Agricultural production is the largest program area in terms of employment with over 63% of the total number of employees. Even when only full-time employment is considered, over 56% of the positions fell in the area of agricultural production.

Trends in Employment

The increase between 1974 and 1977 of some 10,100 persons employed in agricultural production can be explained in part with the increased areas included in the State. Such areas as Gila Bend and Graham County, were included in the 1977 estimate and not in the 1974 data. These areas include a significant number of businesses involved in production agriculture. Another factor contributing to the increased number of persons employed in production agriculture is the increasing size of production units coupled with attempts to reduce production cost by using part-time labor. A comparison of full-time employment in agriculture for the randomly sampled businesses prior to 1974 (table 3) and again in 1977 (table 4) shows an increase of 20 persons or a 1.1% increase. The increase in total employment in agriculture of over 76% is thus caused by a vast expansion in the use of part-time employees among those businesses sampled.

The Agricultural Supplies/Service program area also shows an increase in the number of persons employed from the 1974 estimates. The increase of 238 indicates continued expansion of employment in the areas of sales, processing and service to agriculture.

Actual changes in the number of persons employed by the randomly selected agricultural businesses surveyed in 1977 and reported in tables 3 and 4 can be seen visually in figure 3. Data in both tables are for the same businesses, table 3 prior to 1974 and table 4 for 1977.

Both the instructional program areas of Agricultural Mechanics and Agricultural Resources show a slight decrease in the number of full-time employees. Neither of these two decreases is large enough to be considered a definite trend.

Table 1. Number and percentage of agricultural businesses by types in the original survey, random sample and new business categories.

Occupational Area and Type of Business	Number of Businesses			Total Surveyed 1977	Percentage of Original Businesses Included in Random Sample
	Original Population 1973-74	Random Sample	New Business		
Crop Production Only (Farms producing field or vegetable crops)	663	50	95	145	7.5
Ornamental Horticulture (Businesses engaged in the production, sales or maintenance of plants, shrubs or turf)	205	30	18	48	14.6
Agricultural Service (Professional agriculturalists)	201	30	25	55	14.9
Livestock Production Only (Ranches, feedlots and dairies not engaged in crop production)	275	23	39	62	8.4
Livestock and Crop Production (Farms engaged in the production of both crops and livestock)	209	15	31	46	7.2
Agricultural Machinery Sales and Service Businesses which sell, repair or maintain agricultural equipment)	89	10	5	15	11.2
Agricultural Processing (Cotton gins, seed delinting, packing houses, etc.)	129	24	26	50	18.6
Farm Service (Custom tillage, harvesting, fertilizing insect control, etc.)	143	14	24	38	9.8
Farm Supply (Sales of feed, seed, fertilizers, agricultural chemicals and livestock supplies, etc.)	86	12	33	45	14.0
Citrus Production (Farms engaged in the production of citrus only)	65	4	2	6	6.2
Agricultural Research (Businesses whose function is the improvement of crops and livestock through research)	14	3	0	3	21.4
Forestry (Governmental agencies and private businesses concerned with the production & conservation of forest products)	7	1	1	2	14.3
Agricultural Finance (Businesses whose function is to supply operational and capital financing to agricultural producers)	27	2	1	3	7.4
Totals	2,113	218	309	527	10.3

Table 2. Estimated number of persons employed in selected areas of Arizona requiring knowledge or skill in agriculture reported by instructional program areas 1977.

Instructional Program Areas	Estimated Number of Persons Employed in Jobs Requiring Agricultural competencies			Percent Employment by Program Areas
	Full-time	Part-time	Total	
Agricultural Production	12,340	9,065	21,412	63.8
Agricultural Supplies/Service	5,354	1,649	7,003	20.9
Agricultural Mechanics	2,305	440	2,745	8.2
Ornamental Horticulture	1,577	525	2,102	6.2
Agricultural Resources	241	52	293	0.9
Total	21,829	11,731	33,555	100.0

Table 3. Employment in agriculture among the 1977 randomly sampled businesses when **previously** surveyed and reported by instructional program areas.

Instructional Program Areas	Number of Employees Needing Knowledge or Skill in Agriculture			Percent Full-time Employment by Program Areas
	Part-time	Full-time	Total	
Agricultural Production	496	673	1169	37.0
Agricultural Supplies/Service	193	536	729	29.5
Agricultural Mechanics	30	403	433	22.2
Ornamental Horticulture	59	186	245	10.2
Agricultural Resources	0	20	20	1.1
Total	778	1,818	2596	100.0

Table 4. Employment in agriculture among the businesses randomly sampled in 1977 reported by instructional program areas N = 218.

Instructional Program Areas	Number of Employees Needing Knowledge or Skill in Agriculture			Percent Full-time Employment by Program Areas
	Part-time	Full-time	Total	
Agricultural Production	2,399	584	2,983	31.8
Agricultural Supplies/Service	317	650	967	35.4
Agricultural Mechanics	10	313	323	17.0
Ornamental Horticulture	20	258	278	14.0
Agricultural Resources	0	33	33	1.8
Total	2,746	1,838	4,584	100.0

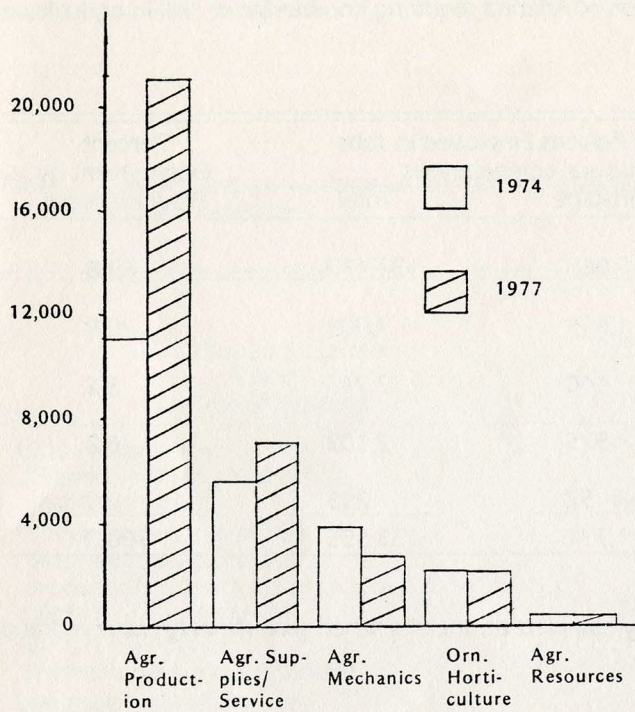


Figure 2. Estimated total employment (both full-time and part-time) by instructional program areas in 1974 and 1977.

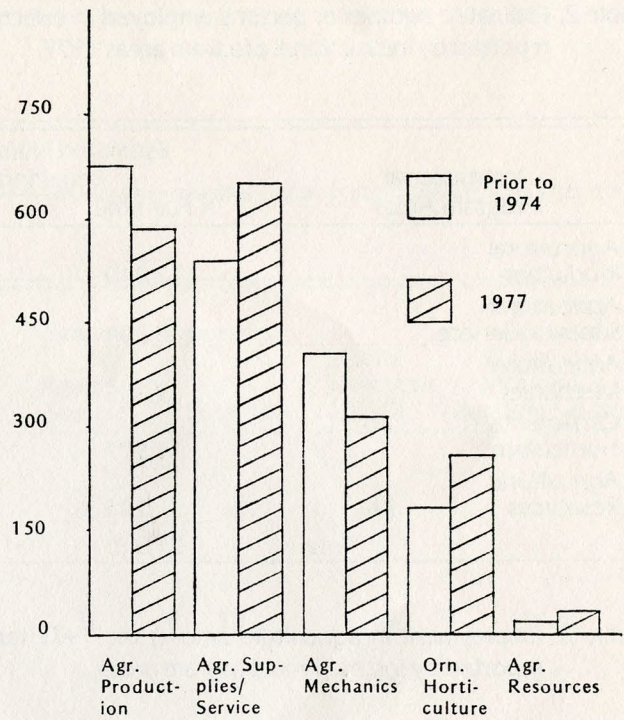


Figure 3. Full-time employment by instructional program areas for the randomly sampled agricultural businesses prior to 1974 and again in 1977.

IMPLICATION FOR AGRICULTURAL EDUCATION IN ARIZONA

The most important finding of the 1977 update was the continued expansion in the number of employees found to need agricultural competencies. The increase from the 1974 estimate of total agricultural employment (23,455) to the 1977 estimate (33,555) represents an expansion of over 43%. Some indication of where such expansion occurred can be gained from table 5 which shows both full-time and part-time employment for 1977. A logical implication of this finding is the need to continue to provide educational opportunities in agriculture in Arizona. In fact, the quantity and quality of such opportunities should be expanded in line with employment opportunities.

The significant increase in the number of part-time employees requiring agricultural knowledge and skill is

also an important development. Educational agencies, providing instruction in agriculture, must make an effort to provide preparation for persons filling these part-time positions. This may require modified types of instructional programs.

The continuing number of persons employed in production agriculture indicates that production agriculture is still important in Arizona. Therefore, educational programs in agriculture must continue to provide basic instruction in production agriculture while expanding the instructional programs and training opportunities in non-production. Educational agencies should pay particular attention to expanding their instructional programs in the area of agricultural supplies and service.

Table 5. Previous and present opportunities in agriculture among the randomly sampled businesses categorized by instructional program areas and job titles.

Instructional Program		Previous Employment		Present Employment		Total
Job Title		Part-time	Full-time	Part-time	Full-time	
Agricultural Production						
Field Hand Laborer		326	94	2308	11	2319
General Farmhand		70	139	35	214	249
Irrigator		69	74	10	60	70
Cowboy		4	29	9	36	45
General Farm Foreman		1	57	0	32	32
Farm Owner-Manager		7	56	2	64	66
Cattle Feeder		1	28	0	17	17
Milker		0	19	0	18	18
Farm Manager		0	15	0	23	23
Kennelman		8	6	19	5	24
Harvest Crew Leader		0	8	0	14	14
Field Superintendent		0	3	2	3	5
Irrigation Foreman		0	4	0	6	6
Veterinarian		0	15	0	15	15
Veterinarian Assistant		3	12	0	9	9
Animal Keeper		0	16	2	15	17
Dairy Herdsman		0	6	0	3	3
Ranch Foreman		0	6	0	6	6
Vocational Agr. Teachers		4	6	0	5	5
Ranch Owner-Manager		0	12	0	9	9
Ranch Manager		0	4	0	3	3
Feedlot Manager		0	4	0	3	3
Agronomist		0	1	0	2	2
Dairyman		1	5	0	4	4
All Other Job Titles		2	54	12	7	19
	Sub Total	496	673	2399	584	2983
Agricultural Mechanics						
Farm Equipment Mechanics		2	62	0	84	84
Wheel Tractor Operator		22	75	9	92	101
Feedmill Maint. Man		0	80	0	5	5
Truck Driver		1	44	0	17	17
Agr. Eng. Technician		0	8	0	5	5
Farm Equipment Welder		0	63	0	45	45
Constr. Mnt. Irrigation Structures		0	11	0	8	8
Farm Equipment Partsman		0	7	0	11	11
Farm Equipment Serviceman		0	4	0	7	7
Harvest Machine Operator		0	6	1	3	4
Water Master		0	9	0	12	12
Farm Equipment Foreman		0	6	0	3	3
Farm Equip. Shop Foreman		0	4	0	6	6
Maintenance Man		0	1	0	4	4
Farm Equip. Mechanics Helper		0	1	0	4	4
Farm Supply Equipment Service		0	4	0	3	3
All Other Job Titles		5	118	0	4	4
	Sub Total	30	403	10	313	323
Ornamental Horticulture						
Landscape Gardener		5	27	0	32	32
Groundskeeper		0	31	5	27	32
Nursery Worker		0	4	0	27	27
Laborer, Golf Course		9	29	0	29	29
Nursery Salesman		11	14	4	20	24
Nurseryman		22	17	0	10	10
Tree Pruner		0	2	0	5	5
Agr. Hort. District Supervisor		3	15	0	5	5
Agr. Hort. Assist. Dist. Supervisor		0	1	0	20	20
Florist		5	10	5	21	26
Greenskeeper		0	7	0	9	9
Superintendent, Greens		0	5	0	4	4
Landscape Architect		0	3	1	3	4
Horticulturalist		0	4	0	2	2
Greenhouse Manager		0	2	0	2	2
Entomologist		0	1	0	2	2
All Other Job Titles		4	14	5	40	45
	Sub Total	59	186	20	258	278

Instructional Program		Previous Employment		Present Employment		Total
Job Title		Part-time	Full-time	Part-time	Full-time	
Agricultural Supplies/Service						
Plant Employees		119	13	221	115	336
Gin Fieldmen		1	1	2	4	6
Ditch Rider		0	3	0	1	1
Bookkeeper		0	11	4	38	42
Ginner		6	28	1	25	26
Farm Supply Salesman		0	23	0	58	58
Feedmill Operator		0	9	0	24	24
Farm Equipment Salesman		0	8	0	7	7
Warehouse Man		0	0	15	41	56
Gin Manager		0	8	0	9	9
Fertilizer and Insecticide Salesman		13	27	18	26	44
Shipping Clerk		0	2	0	5	5
Yard Man		5	0	5	0	5
Press Man		18	0	9	0	9
Office Managers		0	0	0	5	5
Farm Supply Feed Store Employee		3	2	0	3	3
Farm Supply Foreman		0	3	0	5	5
Agricultural Processing Foreman		0	15	4	4	8
Meat Cutter		1	216	2	97	99
Assistant Gin Manager		0	7	0	3	3
Butcher		4	37	3	35	38
Warehouse, Superintendent		0	1	0	3	3
Agricultural Processing Mgr.		0	7	0	7	7
Feedmill Foreman		0	6	1	4	5
Agriculture Machinery Sales/Service Manager		0	8	0	8	8
Assist. Gin Superintendent		0	2	0	1	1
Livestock Buyer		0	2	0	0	0
Feed Salesman		0	9	2	6	8
Egg Candler		0	1	0	0	0
Farm Equipment Sales Manager		0	4	0	3	3
Farm Service Manager		0	6	0	3	3
Packing House Manager		0	5	0	3	3
Farm Supply Manager		0	10	0	7	7
Salesman, Driver		0	3	0	15	15
Gin Clerk		3	0	2	1	3
Stable Owner-Manager		0	1	0	1	1
Agriculture Loan Officer		0	2	0	3	3
Farm Service Owner		0	4	0	9	9
All Other Job Titles		20	47	28	71	99
Sub Total		193	536	317	650	967
Agricultural Resources						
Crop Research Scientist		0	2	0	2	2
Soil Scientist		0	2	0	1	1
Soil Conservationist		0	3	0	3	3
Range Conservationist		0	1	0	2	2
Yard Foreman		0	3	0	1	1
All Other Job Titles		0	19	0	22	22
Sub Total		0	20	0	33	33
Grand Total		778	1818	2746	1838	4584

SELECTED REFERENCES

- Beach, T. O., **Occupational Opportunities and Training Needs for Agricultural Employment in Selected Areas of Arizona—Yuma County**, Arizona Western College, 1971.
- Bell, Richard E., "Agriculture/Agribusiness: An American Bulwark," Remarks made before a National Seminar on Agriculture and Agribusiness, sponsored by the U.S. Office of Education, Kansas City, Missouri, March 24, 1976.
- Hamilton, James B. **Occupational Opportunities and Training Needs for Agricultural Employment in Selected Areas of Arizona—Eastern Maricopa County**, Research Report 264, Agricultural Experiment Station, University of Arizona, Tucson, 1971.
- Zurbrick, Phillip R., **Occupational Opportunities and Training Needs for Agricultural Employment in Selected Areas of Arizona—Pima County**, Research Report 268, Agricultural Experiment, University of Arizona, Tucson, 1972.
- Zurbrick, Phillip R., **Occupational Opportunities and Training Needs for Agricultural Employment in Selected Areas of Arizona**, Research Series Number Three, Department of Agricultural Education, University of Arizona, Tucson, 1973.
- Zurbrick, Phillip R. **An Update: Employment Trends in Agriculture for Selected Areas of Arizona**, Research Report 275, Department of Agricultural Education, University of Arizona, Tucson, 1976.

